Journal of the Lepidopterists' Society
51(1), 1997, 32–46

THE IDENTITY OF *FILATIMA ORNATIFIMBRIELLA* (CLEMENS 1864) (GELECHIOIDEA: GELECHIIDAE)

RONALD W. HODGES

AND

D. ADAMSKI

Systematic Entomology Laboratory, Agricultural Research Service, USDA, c/o U.S. National Museum of Natural History, Washington, D.C. 20560, USA

ABSTRACT. Adults of *Filatima ornatifimbriella* (Clemens 1864) can be confused with three other species, two of which, ***Filatima occidua*** and ***Filatima adamsi*** are new. *Filatima ornatifimbriella* (Clemens) and *F. xanthuris* (Meyrick) are redescribed, and complete synonymy for each species is given. A lectotype is designated for *Gelechia amorphaeella* Chambers 1877. Photographs of wing patterns and scanning electron micrographs of diagnostic wing features are included. A key to the species is provided in conjunction with illustrations of male and female genitalia.

Additional key words: Lepidoptera, Gelechiidae, *Filatima*, *ornatifimbriella*.

Classifications based on single character systems often result in recognition of polyphyletic groups. More natural classifications at the species and generic levels for Lepidoptera result when genital characters are analyzed together with head and venational characters. This realization by previous lepidopterists enabled them to recognize *Gelechia* Hübner as a composite taxon and prompted a transfer of species from this concept to existing or newly recognized genera (Busck 1939, Sattler, 1960). *Filatima* (Busck 1939) was recognized as a result of these observations.

Filatima is characterized as follows: labial palpus recurved to near vertex, third segment nearly as long as second segment, anteroventral scales of second segment divergent, forming a "furrowed brush;" ocellus present; forewing with M_2, M_3, and CuA_1 somewhat approximate; hindwing with M_3 and CuA_1 connate; Rs and M_1 approximate; male hindwing often with curtain scaling (Busck 1939 ["curtain scales"]; Clarke 1947 [curtain scaling]) within area from wing base to slightly beyond end of cell and between $Sc+R_1$ and Rs (Figs. 8–9), other sex scales on posterior half of discal cell and basal portion of cells M_3–CuA_1 and CuA_1–CuA_2, and part of anal area (Figs. 8–10); male genital capsule enclosed within eighth segment; uncus hood shaped; gnathos narrow and somewhat recurved; costal lobe of valva elongate and narrow; saccular lobe of each valva asymmetric; vinculum rounded; aedeagus with lateral sclerite from zone and several other internal sclerites; ventral surface of eighth tergum with paired, basolateral scale pencils, dorsal surface usually with prominent, long, anteriorly directed scales arising posteromedially; female genitalia with antrum sclerotized or membranous; inception of ductus seminalis on anterior part of accessory bursa; posterior

part of corpus bursae and accessory bursa often with dense microtrichia; signum present or absent.

Most *Filatima* are Holarctic in distribution with the greatest species' diversity in semiarid areas of western United States and Mexico. Their larvae are leaf tiers on *Acacia* Mill., *Amorpha* L., *Astragalus* L., *Cercidium* Tul., *Glycyrrhiza* L., *Leucaena* Benth., *Lupinus* L., *Mimosa* L., *Prosopis* L., *Robinia* L., *Thermopsis* Robt. Brown, *Vicia* L. (Fabaceae); *Prunus* L., *Purshia* DC. (Rosaceae); *Ribes* L. (Saxifragaceae); *Vaccinium* L. (Ericaceae); *Phoradendron* Nutt. (Loranthaceae); *Salix* L. (Salicaceae); and *Betula* L. (Betulaceae) (host information taken from specimen label data on material in USNM collection).

The closely similar wing patterns of *Filatima ornatifimbriella* (Clemens) and *F. xanthuris* (Meyrick) have led to their being misidentified in museum collections as well as confused with the other species described herein. The goals of this study are to clarify the taxonomic relationships among these species and to provide efficient means for their identification.

METHODS

The *Methuen Handbook of Colour* (Kornerup & Wanscher 1978) was used as a color standard for the description of the adult vestiture. Genitalia were dissected as described by Clarke (1941), except mercurochrome and Chlorazol Black E (Kodak) were used as stains. In addition, the ventral part of the genital capsule was separated from the dorsal part so both aspects could be examined with minimal distortion and confusion related to overlap (Fig. 15 contrasted with Figs. 16–18), following Pitkin (1984) and Huemer (1987). Terminology of genitalia follows Klots (1970). Pinned specimens and genital preparations were examined with stereoscopic and compound microscopes. Wing measurements were made using a hand-held micrometer. Specimens for SEM studies were mounted on stubs using double-sticky tape and coated with gold-palladium for five minutes with a HUMMER-X sputter coater. Wing scale ultrastructure was studied using an AMRAY 1810 Scanning Electron Microscope.

RESULTS

Key to the Species of *Filatima* Confused with *F. ornatifimbriella*

1. Male 2
   Female 4
2. Valval saccular lobes slightly asymmetrical (Fig. 16) . . . . . *ornatifimbriella*
- Valval saccular lobes greatly asymmetrical (Figs. 17–18) 3
3. Lateral sclerite from zone projected from aedeagus, curved, ventral sclerite subelliptical, without a serrate edge (Fig. 20) . . . . . *xanthuris*
- Lateral sclerite from zone not projected from aedeagus, straight; ventral sclerite subtriangular, with a serrate edge (Fig. 21) . . . . . *adamsi*

4. Antrum sclerotized, signum present (Figs. 22, 24) 5
- Antrum membranous, signum absent (Fig. 23) ..... *xanthuris*
5. Membrane adjacent to anterior apophyses forming a deep invaginated pocket, microtrichia within (Fig. 22) ..... *ornatifimbriella*
- Membrane adjacent to anterior apophyses not forming an invaginated pocket, without microtrichia (Fig. 24) ..... *occidua*

Filatima ornatifimbriella (Clemens 1864) (Figs. 1, 11–12, 16, 19, 22)

Gelechia ornatifimbriella; Clemens 1864:420; Chambers 1878b:145; Smith 1891:102; Dyar 1903:517; Busck 1903:899; Barnes & McDunnough 1917:157; Forbes 1923:271; Meyrick 1925:84; McDunnough 1939:71.

Filatima ornatifimbriella; Hodges 1983:23.

Gelechia unctulella; Zeller 1873:257–8; Chambers 1878b:147; Smith 1891:102; Dyar 1903:513; Busck 1903:878; Barnes & McDunnough 1917:157 [jr. syn. of *ornatifimbriella*]; Forbes 1923:267; Meyrick 1925:84 [jr. syn. of *ornatifimbriella*]; McDunnough 1939:71 [jr. syn. of *ornatifimbriella*]; Busck 1939:575 [jr. syn. of *ornatifimbriella*].

Gelechia xanthuris; McDunnough 1939:72 [misident.].

Filatima xanthuris; Busck 1939:576 [misident.].

Gelechia amorphaeella; Chambers 1877:124; Chambers 1878a:111; Chambers 1878b:141; Smith 1891:100; Dyar 1903:516; Barnes & McDunnough 1917:158; McDunnough 1939:71.

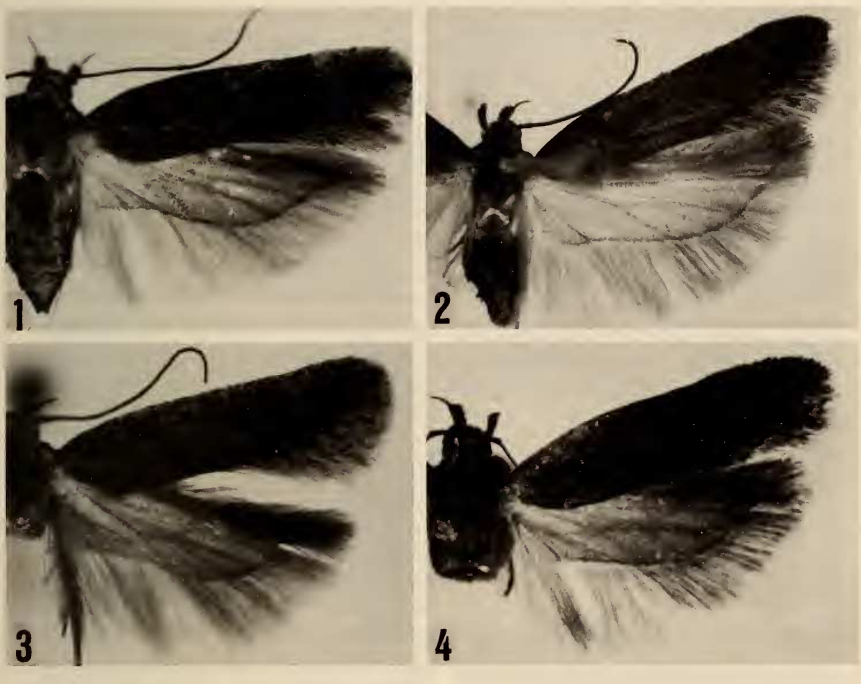
Filatima amorphaeella; Busck 1939:575; Hodges 1983:23, [jr. syn. of *ornatifimbriella*].

Gelechia amorphella; Busck 1903:891 [missp., unrecognized]

Gelechia amorphella; Meyrick 1925:84 [emend.].

Diagnosis. Gnathos hooklike apically, costal lobe of valva produced slightly beyond saccular lobe, saccular lobe narrow, posterior margin of vinculum entire, lateral sclerite of aedeagus spinose and medially twisted, dorsal lobe truncate apically, ventral part of antrum with two subequal ribbonlike sclerites, posterior part of corpus bursae with dense microtrichia, signum small, dentate. Most specimens of *ornatifimbriella* can be recognized by the large circular discal spots and the pale grayish-brown distal 1/5 of the forewing.

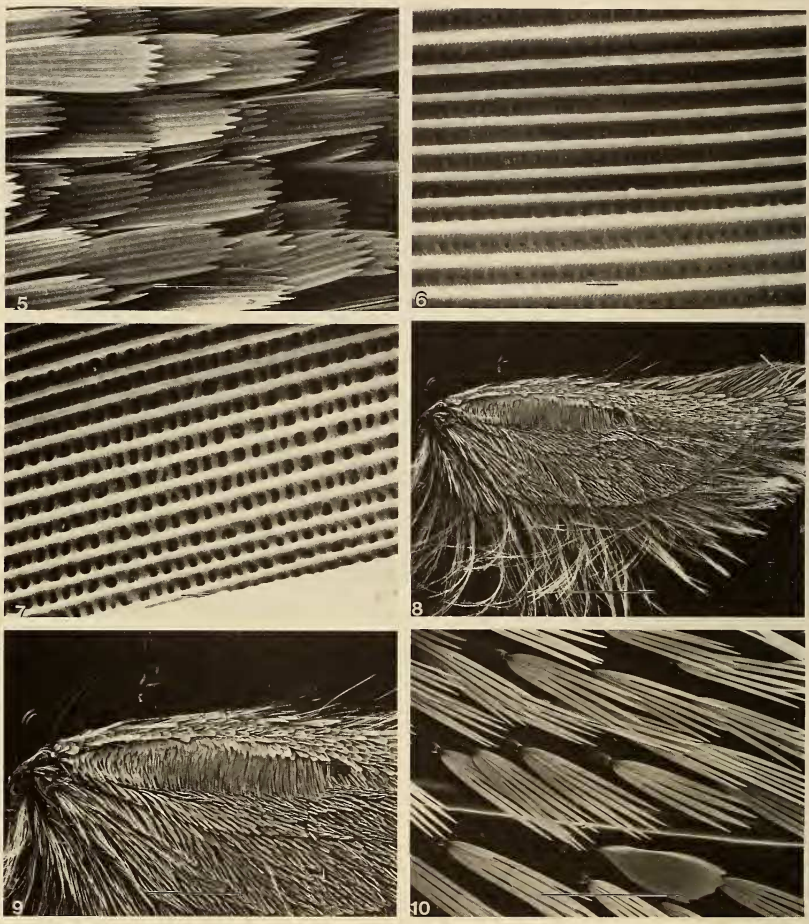
Description. *Head*: haustellum dark brown basally, pale grayish brown distally; maxillary palpus dark brown; dorsal and medial surfaces of labial palpus pale grayish brown, ventrolateral surfaces dark brown or scales pale brown basally, dark brown apically; vertex of second segment with individual scales pale grayish brown basally, brown or dark brown distally; frons with pale grayish-brown scales medially, dark-brown scales in front of eye; vertex and frons slightly darker than frons, scales with lustrous reflections, each scale gradually widened from base, apical margin entire, rounded, scales posterad of eye dark brown; antennal scape, pedicel, and a variable number of basal flagellomeres dark brown above, other flagellomeres with individual scales pale grayish brown basally, dark brown distally, antenna yellowish gray underneath. *Thorax*: mesonotum and tegula pale grayish brown intermixed with brown; lateral surface of legs mostly dark brown intermixed with pale grayish brown, tibiae with a narrow white band at 1/2 length and apex, apex of each tarsomere white, mesial surface white. *Forewing* (Fig. 1): length 6.5–8.5 mm (n = 13); most wing scales pale grayish brown basally, dark brown distally, each scale gradually widened from base, distal margin serrate (Fig. 5 of *F. xanthuris*); anterior margin of wing dark brown basally, becoming mottled dark brown and gray to 3/4 length, then pale grayish brown; a dark-brown subcircular spot at 3/5 length of cell and one at end of cell; discal spots large or small, equal or distal spot larger, separate or united; mid-discal spot absent in some specimens; scales on undersurface pale grayish brown basally, brown apically; anterior margin brown. *Hindwing*: male with one acanthus, female with two acanthi; upper surface pale grayish brown, darkening slightly to apex, undersurface pale gray/off-white, veins and margin of wing darker; undersurface of male with curtain scaling (Figs. 8–9 of *F. xanthuris*) from wing base to slightly beyond end of cell and between $Sc+R_1$ and Rs; curtain scaling perpendicular to anterior margin, extending to near middle of cell; each



FIGS. 1–4. Species of *Filatima*. **1,** female *F. ornatifimbriella* (Clemens); **2,** male *F. xanthuris* (Meyrick); **3,** holotype female of *F. adamsi*, n. sp.; **4,** holotype male of *F. occidua*, n. sp.

scale elongate, with deeply dissected distal margin; male with pale-gray sex scales between veins posterad of curtain scaling to anal area (Figs. 8–10 of *F. xanthuris*). *Abdomen*: terga 1–6/7 with basal part grayish brown, distal margin white; sterna mostly pale grayish brown medially, brown laterally; male eighth tergum an invaginated pouch (Fig. 11), with piliform sex scales originating from anterolateral arms; male eighth sternum (Fig. 12) with two short anterolateral arms, distal emargination broad and rounded. *Male genitalia* (Figs. 16, 19): gnathos elongate, narrowed distally forming a recurved hook; costal lobe of valva narrow throughout length, setose, extending slightly beyond saccular lobe; saccular lobes nearly symmetrical, setose, strongly arched medially and curved dorsally at apex; posterior margin of vinculum entire; aedeagus with lateral sclerite from zone spinose, medially twisted, dorsal lobe (=sclerotized lobe from zone (Hodges 1986)) truncate apically, internal lobe longer than ventral lobe, and with broader distal margin. *Female genitalia* (Fig. 22): ovipositor with two telescopic membranous parts; posterior apophyses much longer than anterior apophyses; membrane adjacent to anterior apophyses forming a deeply invaginated pocket bearing microtrichia; antrum with two subequal, ribbonlike sclerites ventrally, one subtriangular and one oval sclerite dorsally; corpus bursae and accessory bursae with many hairlike microtrichia within posterior end; inception of ductus seminalis on anterior part of accessory bursae; signum heavily sclerotized, small, anterior margin finely dentate.

Types. *Gelechia ornatifimbriella* Clemens. Holotype: ♂; type no. 7347; "Ill[inois];" "♂ genitalia slide by RW Hodges, 2936" [Academy of Natural Sciences of Philadelphia, ANSP]. *Gelechia unctulella* Zeller. Holotype: ♂; "type 1703" [red label]; "Dallas, Tex[as], Boll" "Zeller." "*Gelechia unctulella* Z[eller]" [handwritten, green label]; "♂ genitalia slide

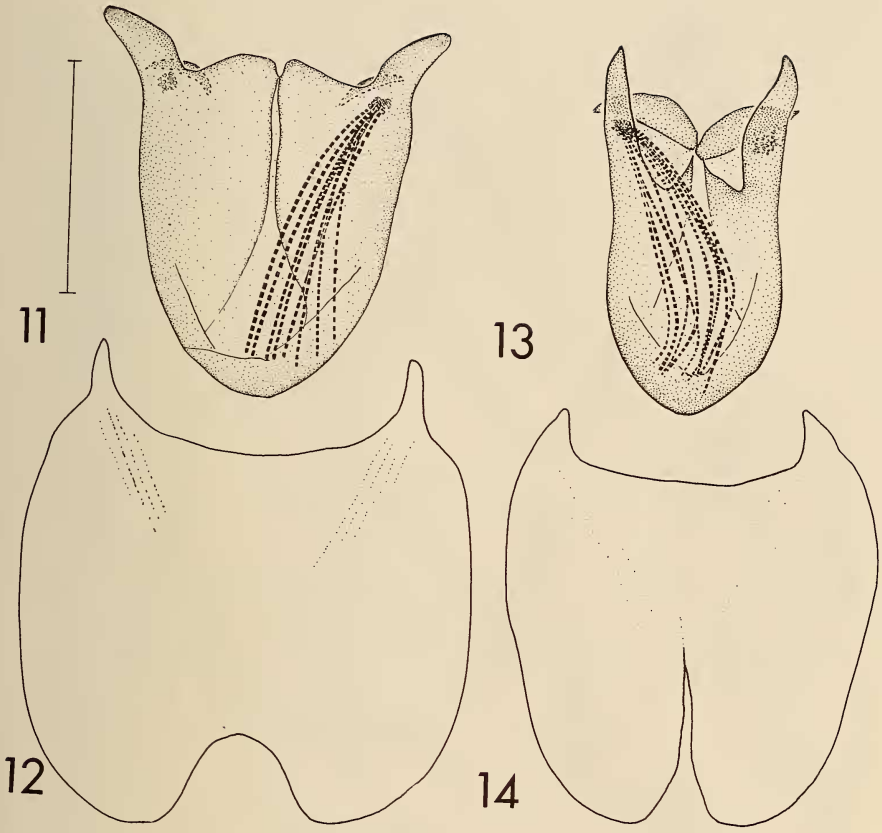


FIGS. 5–10. Ultrastructure of scales of *Filatima* fore- and hindwings. **5–6,** scales of forewing of *Filatima xanthuris* (Clemens); **7,** scales of forewing of *Filatima depuratella* (Busck); **8–9,** hindwing of male *Filatima xanthuris* (Clemens) showing curtain scaling within area from wing base to slightly beyond end of cell; **10,** highly dissected male sex scales within lower half of discal cell, basal part of cells M_3-CuA_1 and CuA_1-CuA_2, and entire anal area. Line scale = 1.0 um for Figs. 5–7, 10; line scale = 1.0 mm for Figs. 8–9.

3285, RW Hodges." [Museum of Comparative Zoology, MCZ]. *Gelechia amorphaeella* Chambers. ***Lectotype***: ♂; present designation; "Type 1480" [red label]; "Chambers, Color[ado]" "*Gelechia amorphaeella*, Cham[bers] Col[lection]" [handwritten label]; "Lectotype, RW Hodges" [handwritten label]; "♂ genitalia slide 3289, by RW Hodges." Lectotype and two paralectotypes, all with same label data, in MCZ. One specimen of syntype series apparently lost.

Foodplants. *Amorpha fruticosa* L. (Fabaceae) (Chambers 1878a and pinned specimens).

Distribution. *Filatima ornatifimbriella* is known from five localities: [Rock Island?], Illinois; Halsey, Nebraska; Edgerton, Colorado; Dallas, Texas; and Riverside, California.



FIGS. 11–14. Eighth tergum and sternum of *Filatima*. **11,** eighth tergum of *F. ornatifimbriella* (Clemens); **12,** eighth sternum of *F. ornatifimbriella* (Clemens); **13,** eighth tergum of *F. xanthuris* (Meyrick); **14,** eighth sternum of *F. xanthuris* (Meyrick). Line scale = 1.0 mm.

Adults have been reared from larvae (June–July). The species overwinters as an adult, based on specimen label data; but it does not appear to have been collected at light. Specimens examined: 5 ♂, 8 ♀, 8 slides.

Filatima xanthuris (Meyrick 1927)
(Figs. 2, 5–6, 8–10, 13–15, 17, 20, 23)

Gelechia xanthuris; Meyrick 1927:346; McDunnough 1939:72.
Filatima xanthuris; Hodges 1983:23 [revised status].
Gelechia ornatifimbriella; Clarke 1932:67, pl. 2, fig. 4 (male gen.), pl. 3, fig. 4 (female gen.) [misident.].
Filatima ornatifimbriella; Busck 1939:575, pl. 60, Figs. 11, 11a, 11b (male gen.), pl. 66, Fig. 44 (female gen.) [misident.]; Clarke 1969, 7:99, pl. 49, figs. 4, 4a, 4b (wing pattern, aedeagus, genital capsule), lectotype designation of *Gelechia xanthuris* Meyrick and treatment as junior synonym of *F. ornatifimbriella* [misident.].

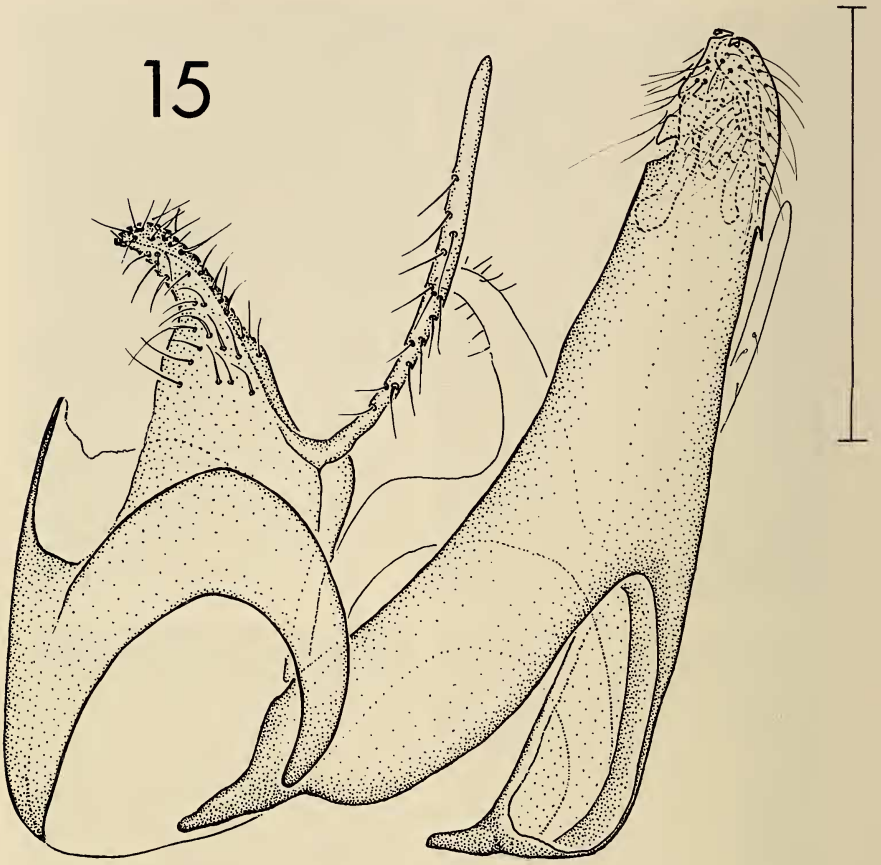
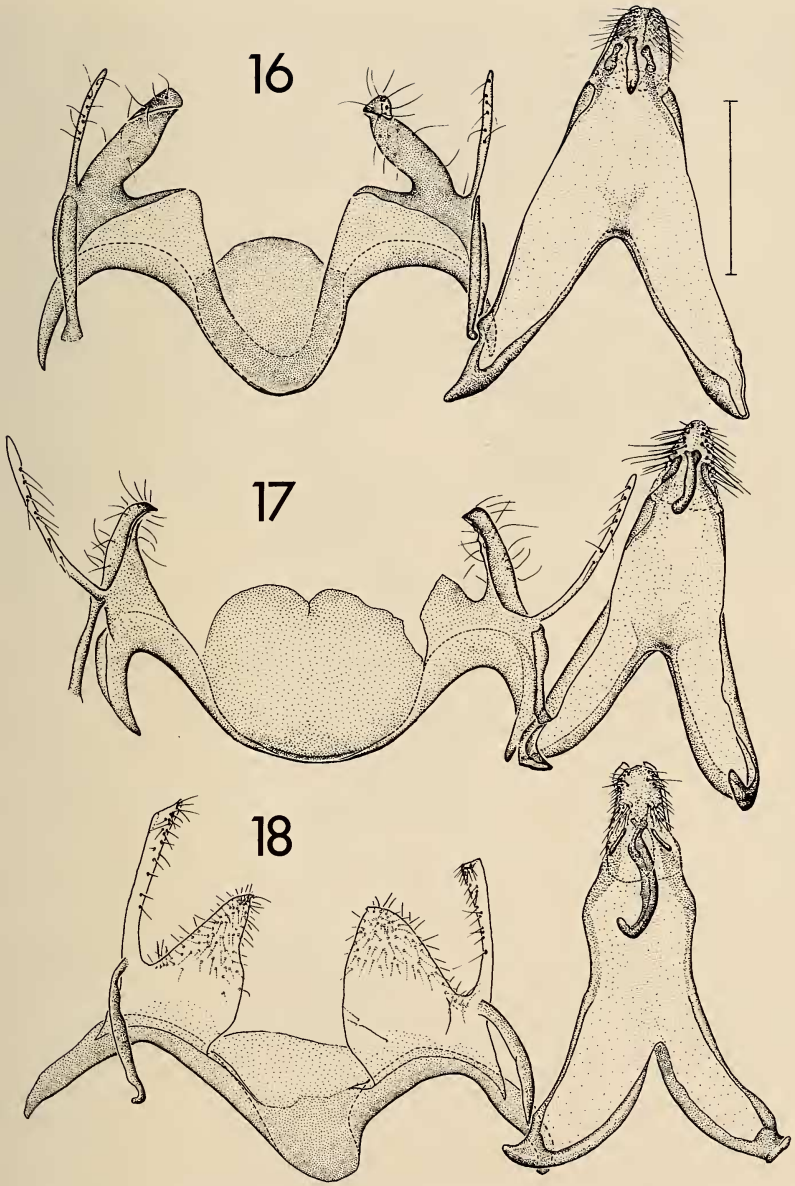


FIG. 15. Lateral view of male genitalia of *Filatima xanthuris* (Meyrick) with vinculum not separated from dorsal elements of genital capsule. Genital capsule rotated laterally 45 degrees. Line scale = 1.0 mm.

Diagnosis. Gnathos apically rounded and blunt, costal lobe of valva extending well beyond saccular lobe, inner surface of left saccular lobe with a broad and angular basal lobe, right saccular lobe slightly widened basally, posterior margin of vinculum slightly emarginate medially, aedeagus with lateral sclerite from zone fingerlike, dorsal lobe obtuse apically, internal lobe slightly longer and narrower than ventral lobe. Most specimens of *F. xanthuris* can be recognized by the united, subrectangular discal spots of the forewing.

Description. As for *F. ornatifimbriella* except: *Forewing* (Fig. 2): length 6.0–10.1 mm (n = 208); individual scales pale brownish gray basally, brown or dark brown distally; discal spots variable, usually subrectangular, large or small, subequal or unequal, separate or united; many specimens with various spots and/or streaks basal to spot at middle of cell; two short streaks along CuP (united in some specimens), one basal spot on midline of cell; one subcostal spot between spots at base of middle of cell; basal spots appear to be present or absent in any combination. *Abdomen*: male eighth tergum narrow (Fig. 13); distal margin of male eighth sternum deeply emarginate medially (Fig. 14). *Male genitalia* (Figs. 15, 17, 20): gnathos apically rounded and blunt; costal lobe of valva narrow throughout



FIGS. 16–18. Male genitalia of *Filatima*. **16,** male genitalia of *F. ornatifimbriella* (Clemens); **17,** male genitalia of *F. xanthuris* (Meyrick); **18,** male genitalia of *F. adamsi*, n. sp. Line scale = 1.0 mm.

length, setose, extending well beyond saccular lobe; saccular lobes asymmetrical, inner surface of left lobe with a broad and angular lobe, right lobe widened basally; posterior margin of vinculum slightly emarginate medially; aedeagus with lateral sclerite from zone fingerlike; apical margin of dorsal lobe obtuse; internal lobe slightly longer and narrower than ventral lobe. *Female genitalia* (Fig. 23): as for *F. ornatifimbriella*, except lobe adjacent to anterior apophyses slightly invaginated; antrum membranous.

Types. Lectotype: ♂, designated and figured by Clarke (1969), BM slide no. 5771, Dividend, Utah, 26 April. Lectotype and nine paralectotypes in The Natural History Museum, London, BM(NH).

Foodplants. *Thermopsis pinetorum* Greene, *Lupinus* sp., *Robinia* sp., *Vicia* sp. (Fabaceae) (pinned specimens).

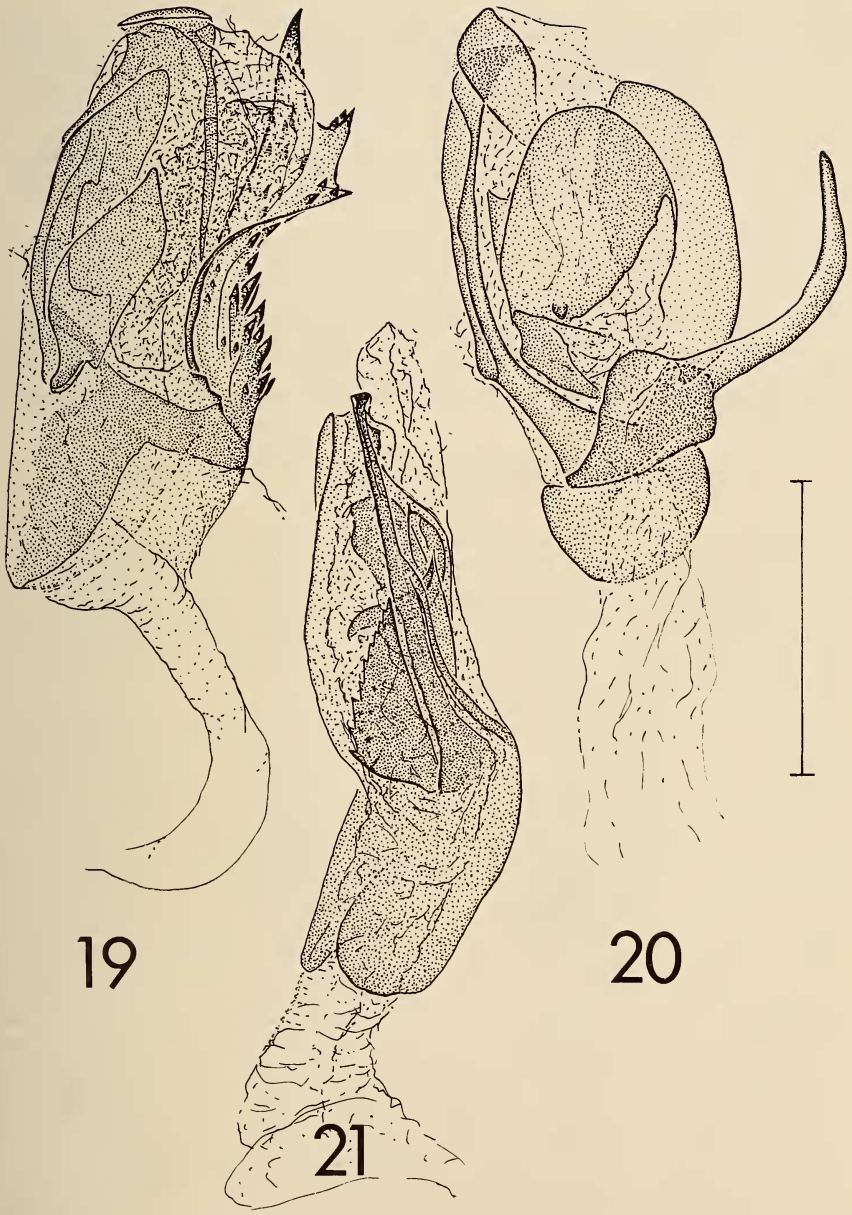
Distribution. *Filatima xanthuris* has been collected in the mountains of North and South Carolina; the Boston Mountains, Arkansas, Tenkiller Lake, Oklahoma; Silverton, Colorado; Guadalupe Mountains, Texas; Lincoln County, New Mexico; Coconino County, Arizona; Utah County, Utah; Lander County, Nevada; Riding Mountains, Manitoba; Rocky Mountains in Alberta and British Columbia; generally in Washington; and Lincoln County, Oregon. Adults have been collected from 26 March to 10 October. Specimens examined: 96 ♂, 108 ♀, 68 slides.

Remarks. Preliminary, comparative studies of the ultrastructure of the dorsal forewing scales of *F. xanthuris* and *F. depuratella* (Busck) indicate that *Filatima* with shiny scales have large windows between the longitudinal ridges of each scale, whereas *Filatima* with dull scales have either few smaller windows or no windows between longitudinal ridges (Figs 6–7).

Filatima adamsi Hodges & Adamski, new species
(Figs. 3, 18, 21)

Diagnosis. Frons with scales in front of eye generally concolorous with rest of frons, a few dark-brown scales present. Gnathos broadly curved, costal lobe of each valva slender, gradually widening from 2/5 length to apex, extending well beyond saccular lobe, saccular lobes of valvae asymmetrical, lobe of left valva with mesial margin broadly curved, lobe of right valva with mesial margin sinuous, becoming narrower apically; posterior margin of vinculum entire; aedeagus with sclerites as illustrated. Female genitalia unknown.

Description. *Head*: haustellum and maxillary palpus grayish brown basally, becoming pale grayish brown distally; labial palpus with first segment mainly dark gray brown laterally, second segment grayish orange dorsobasally, then brown almost to apex, apex and ventral scale tuft mottled pale and dark gray, scale tuft narrow, third segment mainly dark brown with scattered off-white scales; frons, vertex, and occiput mainly shining yellowish gray, individual scales darker at apices, scales on frons tipped with dark brown, several brown scales in front of eye, scales on vertex and occiput with small gray area at apex of each; scape and shaft of antenna mainly dark brown, ventral surface of scape yellowish gray, individual scales on shaft paler at base than apex, antenna broken after flagellomere 10/11; ocellus present. *Thorax*: mesonotum and tegula appearing gray brown, individual scales pale yellowish gray basally, gray brown distally; foreleg coxa mottled yellowish gray and gray brown, mainly dark, femur, tibia, and tarsus medium to dark gray brown, with pale scales just beyond 1/2 length of tibia and at apex, apex of tarsomeres 1–4 off-white; midleg similar to foreleg but slightly darker; hindleg unknown. *Forewing* (Fig. 3): length 7.0 mm (n = 1); mainly dark gray brown, individual scales paler at base; an irregular dark gray-brown mark at 3/5 length of cell, a dark gray-brown blotch at end of cell, several dark gray-brown scales along fold from near base to 3/4 length of fold, several pale-gray scales on anterior and posterior margins at 4/5 wing length, fringe on distal margin mainly pale gray, individual scales tipped darker gray. *Hindwing*: undersurface with curtain scales, additional sex scales extending from base of wing toward posterior margin and in the cell to vein 2A. *Abdomen*: upper surface with mostly pale grayish-brown scales intermixed with brown scales; undersurface mostly white mesially, mostly dark-brown scales intermixed with brown scales ventrolaterally; male eighth tergum most similar to that of *xanthuris*, sternum most similar to that of *ornatifimbriella*, except posterior margin less emarginate.



FIGS. 19–21. Male genitalia (aedeagi) of *Filatima* (for orientation note that the ductus ejaculatorius enters the aedeagus on the dorsal surface). **19,** aedeagus of *F. ornatifimbriella* (Clemens); **20,** aedeagus of *F. xanthuris* (Meyrick); **21,** aedeagus of *F. adamsi* n. sp. Line scale = 1.0 mm.

Male genitalia (Figs. 18, 21): vinculum asymmetric, saccus directed toward right; costal lobe of valva wider distally than at base, extending well beyond saccular lobe; saccular lobes asymmetrical, left lobe broad, right lobe narrower apically; posterior margin of vinculum entire; gnathos hook shaped, strongly curved in distal 1/3; aedeagus with several sclerotized flanges and plates on distal 1/2; a prominent, subtriangular plate with serrate lateral margin. *Female genitalia:* unknown.

Types. *Holotype*: ♂. Label data: "M[aine]: West P[oint], Little Wood Is[land], 13 Aug[ust] 1972, S. B. Adams leg." "♂ Genitalia slide by DA, USNM 87529" [green label]. Holotype in National Museum of Natural History, USNM.

Foodplants. Unknown.

Distribution. *Filatima adamsi* is known only from the type locality. It was collected at incandescent light.

Remarks. This species appears closely allied to *F. vaniae* Clarke by sharing similarly shaped costal lobes of the valvae and the aedeagus with a subtriangular ventral sclerite with a serrate edge. They differ in that *adamsi* has wider saccular lobes and longer costal lobes of the valvae. In addition, *vaniae* is paler. The hindlegs are missing on the holotype.

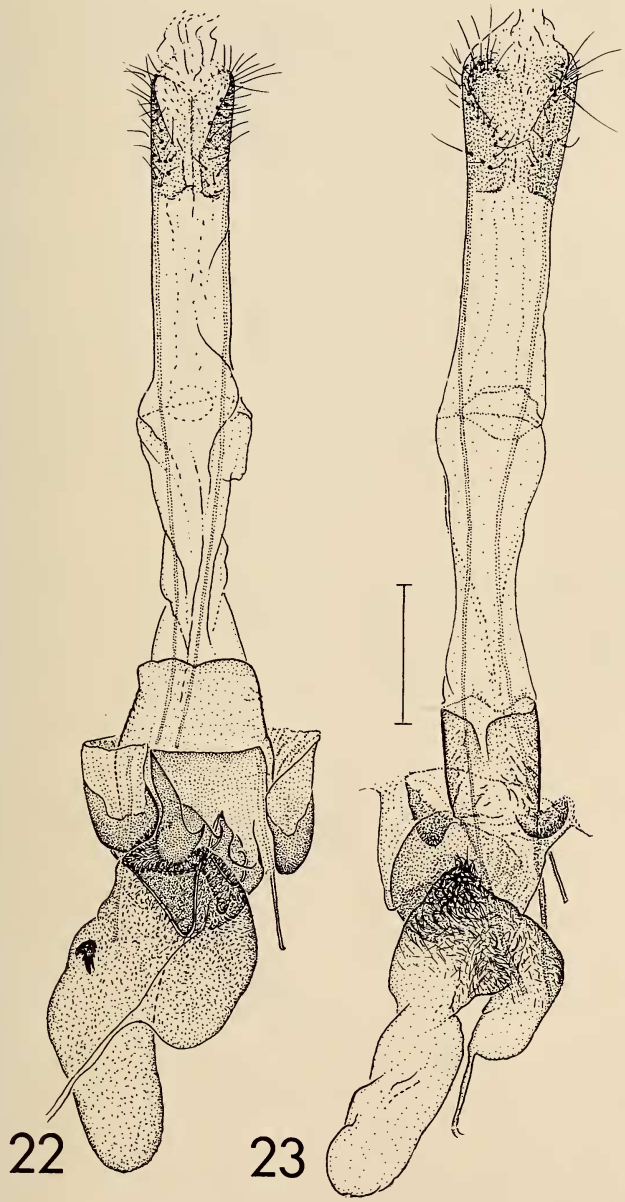
Etymology. This species is named after its collector, Mrs. Sally B. Adams (now Mrs. S. A. Brady).

Filatima occidua Hodges & Adamski, new species
(Figs. 4, 24)

Diagnosis. A small medium to dark-gray moth with a small dark-brown spot at 2/3 the length of the cell and an irregular dark-brown mark at the end of the cell on the forewing. Dorsodistal margin of antrum heavily sclerotized and broadly incurved mesially; anterolateral margin of seventh abdominal sternum with a V-shaped invagination. Right lobe of corpus bursae with dense, fine spicules on basal 1/3; zone of spicules extending basomesially onto antrum. Signum with a pair of inwardly directed, triangular, lateral lobes; each lobe dentate, particularly on posterior margin.

Description. *Head*: maxillary palpus and base of haustellum dark brown, haustellum becoming yellowish brown by 1/2 length; labial palpus mainly brown, individual scales pale gray brown at extreme base of each scale, dorsomesial surface of second segment pale gray from base to 1/2–3/5 length, third segment mottled with many pale-gray/off-white scales, particularly on posterior margin; antenna mottled dark brown and pale gray/off-white, ventral surface of scape pale, most scales of shaft pale nearly to apices, distal margins very dark brown; frons, vertex, and occiput mainly shining pale yellowish gray, dark-brown scales in front of eye directed ventromesially and slightly overlapping on ventral part of frons, scales on vertex and occiput very narrowly margined with slightly darker gray; ocellus present. *Thorax*: tegula dark brown at base, yellowish gray distally, individual scales narrowly margined with darker gray, mesothorax mainly medium to pale gray, individual scales tipped and streaked darker gray; foreleg with coxa mottled dark brown and pale gray, individual scales streaked darker gray on distal 3/4, femur, tibia, and tarsus mainly brown, individual scales pale gray based, apex of each tarsomere with off-white scales; midleg similar to foreleg but surfaces generally paler, tarsomeres with many gray scales; hindleg as for midleg, mesial surface noticeably very pale gray/off-white. *Forewing* (Fig. 4): length 5.5–6.2 mm (n = 5): mainly dark gray, yellowish-brown tipped scales on basal 1/5, dark-gray tipped scales from 1/5–4/5 length and dark-brown tipped scales at apex, a brown spot at 3/5 length of cell and dark-brown blotch at end of cell. *Male genitalia*: unknown. *Female genitalia* (Fig. 24): salient features given in diagnosis.

Types. *Holotype*: ♀, "Pullman, W[ashingto]n, J.F. Clarke, 3-VIII-[19]32"; "Reared from *Lupinus ornatus* [Douglas x Lindl.]"; "3144"; "♀ genitalia slide by AB, USNM 9716" [green label]; "♀ genitalia slide by AB, Aug[ust] 30/[19]43" [handwritten label]. USNM. *Paratypes*: 3 ♀, "Mill Valley, Marin Co[unty], Cal[ifornia], IX-26-1925"; "H.H. Keifer, Collector"; "♀ genitalia slide by DA, USNM 87551" [green label]; "♀ genitalia slide by DA, USNM 87519" [green label]; one specimen not dissected; ♀, same data as above except, "February 4, 1926" ♀, "July 24–31". Paratypes in California Academy of Sciences, San Francisco and USNM.



FIGS. 22–23. Female genitalia of *Filatima*. **22,** female genitalia of *F. ornatifimbriella* (Clemens); **23,** female genitalia of *F. xanthuris* (Meyrick). Line scale = 1.0 mm.

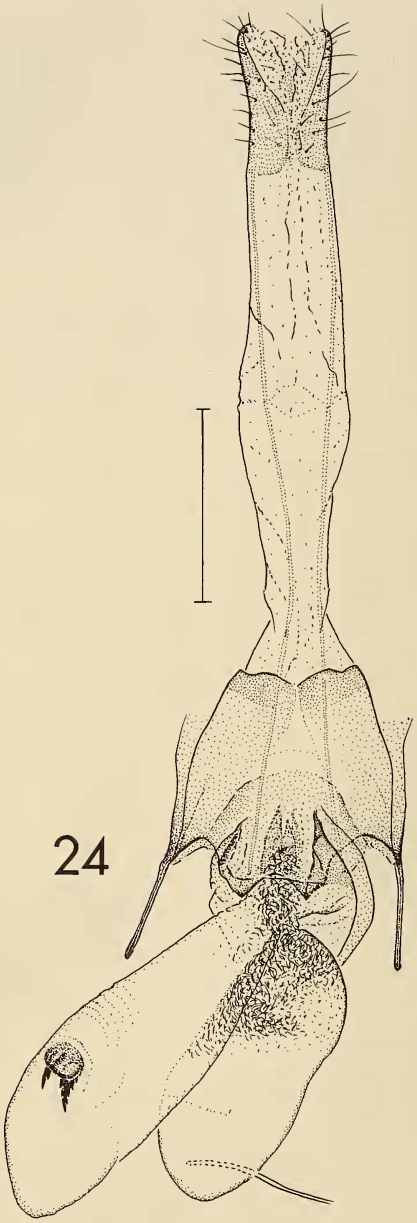


FIG. 24. Female genitalia of *Filatima occidua*, n. sp. Line scale = 1.0 mm.

Foodplants. *Lupinus sericeus* Pursh, var. *sericeus* (Fabaceae). Currently, *L. ornatus* Douglas x Lindl. is a junior synonym of *L. sericeus* Pursh, var. *sericeus*.

Distribution. *Fatima occidua* is known from southeastern Washington and Marin County, California. Adults have been collected on 4 February, 3 August, and 26 September.

Etymology. The specific epithet is derived from the Latin *occiduus*, *-a*, *-um*, meaning setting [of the sun] and referring to the distribution of *occidua*.

DISCUSSION

Comparison of the male and female genitalia suggest that the *Filatima* treated herein probably are distantly related and do not represent a monophyletic group within the genus. The lustrous appearance of the vestiture shared by these species probably is a homoplastic feature within the genus. The shape of the aedeagus of *F. xanthuris* is highly unusual within *Filatima* and immediately separates it from the other species. Until a phylogenetic analysis is completed for all *Filatima*, a suitable hypothesis of relationships among species cannot be made.

ACKNOWLEDGMENTS

We thank Susann G. Braden and Walter R. Brown of the Scanning Electron Microscopy Laboratory, Smithsonian Institution, for help with our ultrastructural studies; Laurence J. Dorr, Department of Botany, Smithsonian Institution, for providing taxonomic information on hostplants; and Philip D. Perkins, Museum of Comparative Zoology, Harvard University, for the loan of the holotype of *Gelechia unctulella* Zeller, and syntypes of *G. amorphaeella* Chambers. We also thank Richard L. Brown, Donald R. Davis, Douglas C. Ferguson, Natalia J. Vandenberg, and two anonymous reviewers for their helpful comments.

LITERATURE CITED

BARNES, W. & J. MCDUNNOUGH. 1917. Check list of the Lepidoptera of boreal America. Herald Press, Decatur, Illinois. ix+392 pp.

BUSCK, A. 1903. A revision of the American moths of the family Gelechiidae. Proc. U. S. Natl. Mus. 25(1304):767–926.

———. 1939. Restriction of the genus *Gelechia* (Lepidoptera: Gelechiidae), with descriptions of new genera. Proc. U. S. Natl. Mus. 86(3064):563–593, pls. 58–71.

CHAMBERS, V. T. 1877. The Tineina of Colorado. Bull. U. S. Geol. Geogr. Surv. Territ. 3(1):121–142.

———. 1878a. Tineina and their food-plants. Bull. U. S. Geol. Geogr. Surv. Territ. 4:107–123.

———. 1878b. Index to the described Tineina of the United States and Canada. Bull. U. S. Geol. Geogr. Surv. Territ. 4:125–167.

CLARKE, J. F. G. 1932. New microlepidoptera from the Pacific coast; (Gelechiidae). Can. Entomol. 64:63–69.

———. 1941. The preparation of slides of the genitalia of Lepidoptera. Bull. Brooklyn Entomol. Soc. 36:149–161.

———. 1947. Notes on, and new species of, American moths of the genus *Filatima* Busck (Gelechiidae: Lepidoptera). J. Washington Acad. Sci. 37(8):263–275.

———. 1969. Catalogue of the type-specimens of microlepidoptera in the British Museum (Natural History) described by E. Meyrick. Vol. 7. Trustees British Museum (Nat. Hist.), London. 531 pp.

CLEMENS, B. 1864. North American microlepidoptera. Proc. Entomol. Soc. Philadelphia 2:415–430.

DYAR, H. G. [1903] 1902. A list of North American Lepidoptera and key to the literature of this order of insects. U. S. Natl. Mus. Bull. 52:xix+723 pp.

FORBES, W. T. M. 1923. The Lepidoptera of New York and neighboring states. Cornell Univ. Agric. Exp. Sta. Mem. 68:1–729.

HODGES, R. W. 1983. Gelechiidae. *In* R. W. Hodges et al. (eds.), Check list of the Lepidoptera of America north of Mexico. E. W. Classey Ltd. and The Wedge Entomol. Res. Found., London.

———. 1986. Gelechioidea: Gelechiidae (in part). *In* Dominick, R.B., et al. (eds.), The moths of America north of Mexico, Fasc. 7.1.

HUEMER, P. 1987. Eine modifizierte Genitalpräparationstechnik für die Gattung *Caryocolum*. Mitteil. Schweiz. Entomol. Ges. 60:207–211.

KLOTS, A. B. 1970. Lepidoptera. *In* Tuxen, S. L. (ed.), Taxonomist's glossary of genitalia in insects. 2nd ed. Munksgaard, Copenhagen.

KORNERUP, A. & J. H. WANSCHER. 1978. Methuen handbook of colour. 2nd ed. Methuen and Co., Ltd., London. 243 pp.

MCDUNNOUGH, J. 1939. Checklist of the Lepidoptera of Canada and the United States of America. Part II. Microlepidoptera. Mem. So. California Acad. Sci. 2(1):1–171.

MEYRICK, E. 1925. Lepidoptera Heterocera fam. Gelechiadae. *In* Wytsman, P. (ed.), Genera insectorum, 184:1–290, pl. 1–5.

———. 1927. Exotic Microlepidoptera 3(11):321–352.

PITKIN, L. 1984. A technique for preparing complex male genitalia in microlepidoptera. Entomol. Gaz. 37:173–179.

SATTLER, K. 1960. Generische Gruppierung der europäischen Arten der Sammelgattung *Gelechia* (Lepidoptera, Gelechiidae). Deutsche Entomol. Zeitschr. N. F. 7(1/2): 10–118.

SMITH, J. B. 1891. List of the Lepidoptera of boreal America. Am. Entomol. Soc., Philadelphia. vi+124 pp.

ZELLER, P. C. 1873. Beiträge zur Kenntniss der nordamericanischen Nachtfalter, besonders der Microlepidopteren. Zweite Abtheilung. Verhandl. Zool.-Bot. Ges. Wein 23:201–334, pls. III–IV.

Received for publication 12 August 1995; revised and accepted 2 February 1996.